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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,919	09/10/2003	John R. Grassi	GISZ 2 00033	4064

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EXAMINER

LIN, ING HOUR

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/658,919

Applicant(s)

GRASSI ET AL.

Examiner

Ing-Hour Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-18,25,27 and 29-51 is/are pending in the application.
- 4a) Of the above claim(s) 25,27 and 29-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-18 and 36-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-4, 6-18, 36-42 and 43-51, drawn to a process for the casting of metal and a process for reducing the cooling time of a metal that has been cased, classified in class 164, subclass 131.

II. Claims 25, 27, and 29-35 drawn to a mold for the casting of metals, classified in class 164, subclass 361.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice.

The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the casting process and related cooling the mold can be practiced by another materially different apparatus such as cooling bath held in a quenching tank.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with attorney Jay F. Moldovanyi on March 9, 2006 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-4,

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6-18, 36-42 and 43-51. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25, 27, and 29-35 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 36 and 42 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 16 and 22 of copending Application No. 10/614,601. Although the conflicting claims are not identical, they are not patentably distinct from each other because the processing steps in claims 36 and 42 including "contacting said at least a part of said mold with a solvent" and "removing step" in this application are physically equivalent to the steps in claims 16 and 22 of copending Application No. 10/614,601.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1-4, 7-9, 12, 15-17, 36, 37-41, 43, 45 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al.

JP '566 (see abstract) substantially teaches the claimed rapid cooling in a lost wax casting method for casting metal and comprises the use of simultaneous molten metal pouring and forming a partially solidified metal casting including a solidified metal shell by using controlled mist-like cooling water spraying on the mold containing molten metal for the purpose of forming a fine grain solidified metal shell and reducing defect for the casting.

JP '566 fails to teach the use of removing mold. However, Kawaguchi et al (col. 9, lines 65+) teach the use of removing mold after a solidified metal shell in the mold is formed and strong enough to contain the rest of molten metal but before the molten metal contained in the shell has been completely solidified for the purpose of reducing casting defects such as thermal cracking and minimizing adhesion between the casting product and the mold surface. It would have been obvious to one having ordinary skill in the art to provide JP '566 the use of removing mold as taught by Kawaguchi et al in order to further improve the quality of casting and reducing defects.

JP '566 in view of Kawaguchi et al fails to teach the molding method. However,

Pineda et al (col. 2, lines 58+) teach the claimed molding method, a water dispersible mold and method of investment casting for metal by using the mold, comprising the use of a water-soluble binder including phosphate and silica sand having lower heat diffusivity than metal for the purpose of coating a pattern and forming a water dispersible mold and casting metal by a investment casting method (col. 5, lines 39+); and teach the use of dropping the mold into water (col. 6, lines 28+) to create a heat differential to crack a portion of the mold. Further, Pineda et al (col. 6, lines 66+) teach the use of controlling and reducing binder and increasing silica sand or filler for the purpose of making the investment softer and easier to remove it from the casting

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metal. It would have been obvious to one having ordinary skill in the art to provide JP '566 in view of Kawaguchi et al the use of molding method as taught by Pineda et al in order to reduce cycle time of casting and refine the cast grain size by partially removing water cooled mold parts of the water dispersible mold.

11. Claims 6 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59156566 in view of Kawaguchi et al and Pineda et al and further in view of either JP 61245938 or Eldemallawy et al.

JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al fails to teach the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite. However, either JP '938 (see abstract) or Eldemallawy et al (col. 7, lines 7+) teach the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite for the purpose of improving casting shaping quality and the mold removability. It would have been obvious to one having ordinary skill in the art to provide JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al the use of an amount of heat resistant and porous or micro-sphere oxide such as pumice or perlite as taught by JP '938 or Eldemallawy et al in order to effectively improve casting shaping quality and the mold removability.

12. Claims 10-11, 13-14 and 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59156566 in view of Kawaguchi et al and Pineda et al and further in view of either Sahari or Conroy et al.

Pineda et al in view of in view of Carter et al fails to teach the use of controlling the dose of binder or the use of water nozzle. However, Sahari (col. 6, lines 24+) teaches the use of nozzles (water jet, water-steam jet) and submerging the mold into water for the purpose of cooling and removing casting from the re-using the binder agent. Conroy et al (col. 4, lines 19+) teach the use of nozzles 20 and flow rate and pressure of fluid including water and surfacatant for the purpose of removing cores from castings. It would have been obvious to one having ordinary skill in the art to provide JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al the use of water nozzle as taught by Sahari or Conroy et al in order to control cooling the casting in the molten state and remove or crack the water soluble mold from the casting.

13. Claims 18 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al and Carter et al.

JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al fails to teach the use of rapid cooling the molten metal including lowering the mold into a solvent bath. However, Carter (col. 2, lines 47+) teaches the use of rapid cooling such as simultaneous molten metal pouring and immersion cooling for the purpose of forming a fine grain and reducing oxidation pitting for the casting. It would have been obvious to one having ordinary skill in the art to provide JP 59156566 in view of Kawaguchi et al and further in view of Pineda et al the use of rapid cooling the molten metal including lowering the mold into a solvent bath as taught by Carter et al in order to reduce cycle time of casting and refine the cast grain size by partially removing water cooled mold parts of the water dispersible mold.

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Response to Argument

14. Applicant's arguments with respect to claims 1-4, 6-18, 36-42 and 43-51 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IHL

I.-H. Lin

3-17-06

KEVIN KERNS
PRIMARY EXAMINER

Kevin Kerns 3/20/06